# Dome1-P/T

# Dome1HR-P/T *HIGH RESOLUTION*

## User's Manual

Before attempting to connect or operate this product, please read these instructions completely

## Main Features

### 1 Built-in receiver

- Complete digital control with integrated CPU and SD RAM. All configurable options stored in non-volatile memory to protect against power cuts.
- Integration and high durability.
- 16 programmable presets.
- RS485 communication data, dome address 0-511.
- Support Auto tour and pattern.

### 2 Pan/tilt drive

- Innovative design of the structure minimizes the outline shape and dimensions.
- A precision drive positioning system ensures a 0~355°pan rotation.
- Tilt rotation range 0-90°.

### 3 Built-in color camera with high sensitivity and high resolution

- 3.6 mm lens fitted, other sizes available
- Auto back light compensation
- Auto white balance

**Optional keyboard control**

## Preface

The 5” mini dome is an integration of the cutting-edge technique, most developed manufacturing process and years of full experience in the industry. Equipped with high-resolution camera and digital decoder, it represents the trend of the new edition of surveillance product. Being complete-digital-controlled and flexile programmable, it performs an excellent fast-location and continuous object tracing. The simple and compact structure ensures high reliability and long term running.

Super features lead a wide variety of use in large area surveying and moving object tracing. For instance, integration building and banks securing, traffic supervising, power stations watching, airports and stations monitoring. The protocol is open and the dome is compatible with the host of systems.

This manual introduces dome functions and operations. Please read this manual carefully prior to installation and operation.

## Precautions

### 1 Transportation

Domes are sophisticated products and as such should be protected against extremes of pressure, temperature, vibration and humidity during storage and transportation.

### 2 Do not disassemble the Dome module

There are no user serviceable parts or settings inside. Failure to observe this instruction could result in damage to the product and loss of warranty. Only suitably qualified and authorized personnel may undertake repairs.

### 3 Installation

The Dome is designed for ceiling mount only. Do not install the Mini Dome in any other orientation. Failure to comply with this requirement will result in damage to the product.

## 4 Electrical safety

Conform to local Electrical safety codes when use this product, keep at least 50 meter between dome, communication data and high voltage equipment or cables.

If above requirements can not be satisfied, please use steel tube to shield communication Data cable, and make it grounding.

## 5 Cleaning

In order to get clear image, down cover should be cleaned periodically. Be careful when cleaning, only hold down cover edge , avoid direct touching down cover, acid matter in the fingers will corrupt down Cover plating surface. Hard material scratching down cover will lead to vague image. Please use soft clean cloth or other substitution to clean interior and exterior surface. Neutral detergent as well as any high-grade furniture detergent can be used to clean down cover.

## 6 Environment

The operation temperature of the dome is 0? ~40? , humidity is less than 90%, input power supply is DC 12V/1A. Do not use the dome in circumstances where temperature, humidity or power supply variations fall outside the range of specified values.

## 7 Excessive light

It is important that the dome camera is not left in a position where the camera is pointing directly at the sun or other extremely bright light source. This may result in CCD damage and poor image quality.

## 8 Do not install the dome in the outdoor environment

## 9 The dome is ceiling installation

## Functions and Operations

These operating instructions cover the basic operation of the dome and its features. When the dome is used with other manufacturers control system, please regard the system controller instruction as standard. In the event of special requirements outside the scope of this document it is advisable to contact your local distributor.

### 1. Setting the dome ID

Setting dome ID by the DIP Switch of the dome, refer to the dome setting for the details.(P.6)

### 2. Set up and call preset

Preset function is that dome stores current horizontal angle and title angle of pan/Tilt, and position parameters into the memorizer. When necessary dome calls these parameters and adjusts Pan/Tilt and camera to that position. Operator can store and call presets easily and promptly by using controller, the dome supports up to 64 presets.

- To set a preset position [preset] + [N] + [ENTER]
- To call a preset position [Call] + [N] + [ENTER]

### 3. Auto Cruise

The pre-set positions can be programmed to be re-called in a set of sequence. This sequence can be set to automatically cycle from one position to the next at a setting time. This feature is called Auto cruise.

- Cruise sequence can be programmed from 1~16 presets.
- Start Auto cruise : [SHOT] + [1] + [ENTER]
- Stop Auto cruise by moving the joystick.

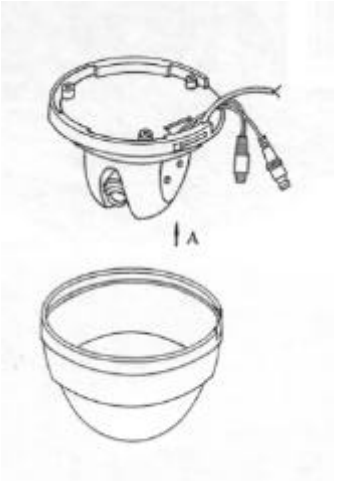
### 4. Auto Pan function

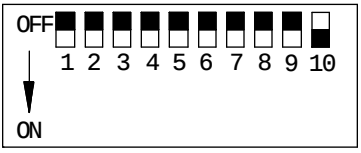
The auto pan function allows you to have the camera move back and forth automatically, at a preset speed between the 2 preset camera positions.

- START : AUTO + N1 + ON + N2 + OFF
  N1 stands for the position you want to start
  N2 stands for the position you want to stop
- STOP : AUTO + OFF
  or Move joystick, the dome will be controlled by manual and the auto pan will stop.

## Dome Setting

According to the different controlling system, confirm the used controlling system before operation setting






ID10 is for RS485 120O impedance. When control distance is far or environment interference is severe, the ID10 should be set “ON”, when the system connects many domes, ID10 of the far these dome from controller should be set “ON”, other domes are set “OFF”.

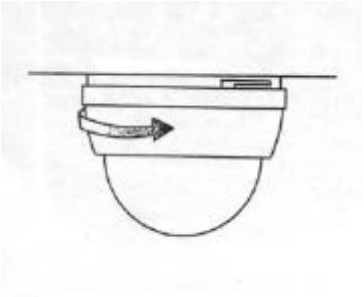
| Address | Switch 9 | Switch 8 | Switch 7 | Switch 6 | Switch 5 | Switch 4 | Switch 3 | Switch 2 | Switch 1 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 10 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 12 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 14 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 15 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 16 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 18 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 19 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 20 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| … | | … | … | … | … | … | … | … | … |
| 510 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 511 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

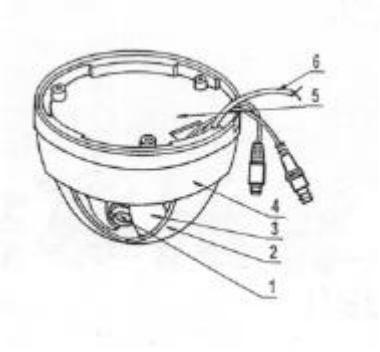
**When there is more than one dome adopted in the system, connect the controlling cable in parallel, set the dome address by setting ID Switcher, control the domes connected with one keyboard controller. Refer to the controlling system manual for the detailed connection and operation.**

## Installation

Prior to installation and use of this product, the following warnings should be observed:

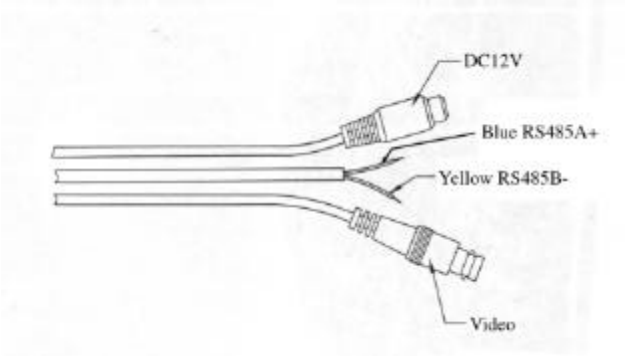
1. Installation and servicing should only be done by qualified service personnel or system installation personnel and conform to all local codes.
2. When unpacking dome package, Pan/Tilt module should be handled with care, not use hard thing to hit camera and other parts to avoid unnecessary trouble.
3. The ceiling should be capable of supporting the dome camera.
4. Domes installation position must be away from high voltage as far as possible.
5. Setting the dome address, controlling mode and protocol appropriately before installation.






1 Camera
2 Down cover
3 Black inner housing
4 Outer housing
5 Installation board
6 Connecting cables

**Dome Connection Diagram**




**Dome Structure Diagram**

**1. Connection Instruction**

1) Video output connects to matrix or monitor
2) RS485 controlling cable: Blue cable connects to RS485A+; Yellow cable connects to RS485B-

**2. Dome Installation**

1) Open the package, take out the installation board and the cables with a connector at one end;

2) Connect the ends of the cables without connector to general cables inside the ceiling; pull the end of the cables with connectors through the hole on the installation board.
3) Fix and secure the installation board to the ceiling with three M4 screws.
4) Plug the connector into the socket on the Pan/Tilt module. Rotate the dome part onto the installation board securely as the picture shows.

## Trouble Shooting Table

| Problem | Probable causes | Solution |
|---|---|---|
| On Power no action no image | Power supply plug-in loose | Plug tightly |
| | Transformer damaged | Replace |
| | Fuse on the power PCB damaged | Replace |
| On Power, self check and image ok, can not control | Protocol setting is wrong | Check the keyboard |
| | Dome ID setting is wrong | Change the dome ID |
| | RS-485 Bus bad connection | Check RS-485 connection |
| Vague Image | Lens loose | Adjust the lens again |
| | Down cover not clean | Clean down cover |

## Intelligence Dome Camera Control Command Reference

**? Camera Interface: RS-485**

·Transmit Method : Asynchronous Interface Half Duplex Serial Commu nication

·Transmit Speed : 9600bps

·Protocol : 1 Stop bit ; 8-bit data; No Parity; 1 Stop bit

**? Command Protocol**

Command length is fixed at 11 bytes (1 packed). The packet's data arrangement is as follow Below.

| | | |
|---|---|---|
| WORD1 | STX (Start of Text) | A0H |
| WORD2 | Receiver Address | 00H~ 1FH |
| WORD3 | Sender Address | 00H~ 1FH |
| WORD4 | COMMAND( 1) | |
| WORD5 | COMMAND( 2) | |
| WORD6 | DATA( 1) | |
| WORD7 | DATA( 2) | |
| WORD8 | DATA( 3) | |
| WORD9 | DATA( 4) | |
| WORD10 | ETX (End of Text) | AFH |
| WORD11 | Check-Sum | |

Calculation of the Check-Sum

- Sum up WORD2 through WORD9
- Deduct the above total from the FFFFH
- Last two digits are the Check-Sum
- For example: In case the total of WORD2 through WORD9 is 567H, A00H
  FFFFH-567H=A98H? Check-Sum = 98H
  FFFFH-A00H=5FFH? Check-Sum = FFH

**? Command Details**

Commands are of two types: PTZ commands and "extended" commands. The PTZ commands (see 3.1 below) specify manual operations, while the extended commands (see 3.2 below) implement camera settings. The command type is identified by Bit 0 of WORD5 ——a "0" denotes a PTZ command, while a "1" denotes an extended command.

### 3.1. PTZ Command (Pan/Tilt/Zoom)

The PTZ command control general manual operations (PAN, TILT, ZOOM, FOCUS, IRIS). The PTZ commands take precedence over all extended commands other than the "special" extended command. The camera can be stopped by setting all bits of WORD4, WORD5 to "0"

The contents which each word shows when Bit0 of WORD5 is "0" as follow:

<table>
<tr><td rowspan="8">WORD4<br>(Command1)</td><td>-Bit7(MSB)</td><td>constant</td><td>0</td></tr>
<tr><td>-Bit6</td><td>Not Used</td><td>0</td></tr>
<tr><td>-Bit5</td><td>Not Used</td><td>0</td></tr>
<tr><td>-Bit4</td><td>IRIS OPEN</td><td rowspan="2">00: IRIS STOP<br>01: IRIS CLOSE<br>10: IRIS OPEN<br>11: Keep the current movement</td></tr>
<tr><td>-Bit3</td><td>IRIS CLOSE</td></tr>
<tr><td>-Bit2</td><td>constant</td><td>0</td></tr>
<tr><td>-Bit1</td><td>FOCUS NEAR</td><td rowspan="2">00: FOCUS STOP<br>01: FOCUS CLOSE<br>10: FOCUS OPEN<br>11: Keep the current movement</td></tr>
<tr><td>-Bit0(LSB)</td><td>FOCUS FAR</td></tr>
<tr><td rowspan="9">WORD5<br>(Command2)</td><td>-Bit7(MSB)</td><td>constant</td><td>0</td></tr>
<tr><td>-Bit6</td><td>ZOOM WIDE</td><td rowspan="2">00: ZOOM STOP<br>01: ZOOM TELE<br>10: ZOOM WIDE<br>11: Keep the current movement</td></tr>
<tr><td>-Bit5</td><td>ZOOM TELE</td></tr>
<tr><td>-Bit4</td><td>TILT DOWN</td><td rowspan="2">00: TILT STOP<br>01: TILT UP<br>10: TILT DOWN<br>11: Keep the current movement</td></tr>
<tr><td>-Bit3</td><td>TILT UP</td></tr>
<tr><td>-Bit2</td><td>PAN LEFT</td><td rowspan="2">00: PAN STOP<br>01: PAN RIGHT<br>10: PAN LEFT<br>11: Keep the current movement</td></tr>
<tr><td>-Bit1</td><td>PAN RIGHT</td></tr>
<tr><td>-Bit0(LSB)</td><td colspan="2">PTZ command(0) / Extension Command(1)</td></tr>
<tr><td>WORD6<br>(DATA(1))</td><td colspan="3">PAN MOTOR SPEED (01H~ 40H)</td></tr>
</table>

| | | |
|---|---|---|
| WORD7 (DATA(2)) | TILT MOTOR SPEED (01H~ 40H) | |
| WORD8 (DATA(3)) | Upper 4 Bits<br>Lower 4 Bits | Focus Motor speed(01H~ 08H)<br>Zoom Motor speed(01H~ 08H) |
| WORD9 DATA9 (4) | FFH | |

There is a bit that controls four motors' rotating direction of PAN/TILT/ZOOM/FOCUS. When the bit is "1", it means that it is effective and it functions. However, when two of the bit that controls the opposite rotating direction are both "1", it means the current action is selected and is to be continued. When two of the bit that controls the opposite rotating direction are both " 0", it means the motor to be stopped.

**3.2. Extension command**

These commands are used to implement non-manual settings---mainly Preset, Swing, Sequence, etc.

| | |
|---|---|
| WORD4 | 00H |
| WORD5 | Command No.01H to FFH (Only Odd Number) |
| WORD6 (DATA(1)) | Parameter1 |
| WORD7 (DATA(2)) | Parameter2 |
| WORD8 (DATA(3)) | Parameter3 |
| WORD9 DATA (4) | Parameter4 |

( 1) Set Preset

| WORD4 | WORD5 | WORD6 | WORD7 | WORD8 | WORD9 |
|---|---|---|---|---|---|
| 00H | 03H | XX | FFH | FFH | FFH |

XX=00H~ 3FH( Preset Number)

( 2) Go to Preset

| WORD4 | WORD5 | WORD6 | WORD7 | WORD8 | WORD9 |
|---|---|---|---|---|---|
| 00H | 07H | XX | FFH | FFH | FFH |

XX=00H~ 3FH( Preset Number)

( 3) Run Pan Swing (1)

| WORD4 | WORD5 | WORD6 | WORD7 | WORD8 | WORD9 |
|---|---|---|---|---|---|
| 00H | 11H | 00H | P1 | P2 | FFH |

P1=00H to 3FH Preset Number (First Specify Position)
P2=00H to 3FH Preset Number (Second Specify Position)

( 4) Stop Swing

| WORD4 | WORD5 | WORD6 | WORD7 | WORD8 | WORD9 |
|---|---|---|---|---|---|
| 00H | 1FH | FFH | FFH | FFH | FFH |

( 5) Run Sequence

| WORD4 | WORD5 | WORD6 | WORD7 | WORD8 | WORD9 |
|---|---|---|---|---|---|
| 00H | 21H | GG | 00H | FFH | FFH |

<GG>: Sequence Number 00H~05H

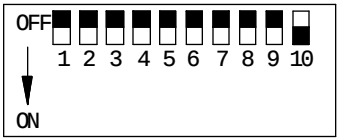
## Technical Data

| | |
|---|---|
| Panning range | 0 ~ 355° |
| Pan speed | 0.45 ~ 45°/sec |
| Tilt range | 0 ~ 90° |
| Tilt speed | 0.45 ~ 45°/sec |
| Communication | RS485 |
| Controls | Pan / Tilt, 16 preset positions |
| Auto pan | ON / OFF |
| Auto Tracking mode | ON / OFF, 1 cruising tracks |
| Power source | 12 Volts DC REGULATED |
| Operating temperature | 0 ~ 40? |
| Dimensions | ~ 160 (Dia) × ~ 115 mm (H) |
| Weight | Approx 550 grams |

Specifications are subject to change without notic

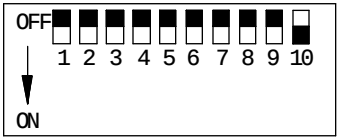
# Multi-protocol Operation

## 1. ID Setting




| ADD | NO.6 | NO.5 | NO.4 | NO.3 | NO.2 | NO.1 |
|---|---|---|---|---|---|---|
| 0 | OFF | OFF | OFF | OFF | OFF | OFF |
| 1 | OFF | OFF | OFF | OFF | OFF | ON |
| 2 | OFF | OFF | OFF | OFF | ON | OFF |
| … | … | … | … | … | … | … |
| 63 | ON | ON | ON | ON | ON | ON |

## 2. Protocol Setting




| Protocol | NO.9 | NO.8 | NO.7 |
|---|---|---|---|
| COP_02 | OFF | OFF | OFF |
| COP_01 | OFF | OFF | ON |
| PELCO-P 9600 | OFF | ON | OFF |
| PELCO-P 4800 | OFF | ON | ON |
| PELCO-D | ON | OFF | OFF |

### 3. Operation of auto panning and auto tracking

| Operation | Function |
|---|---|
| PRESET + 17 + ENTER | To preset NO.17 preset position means to set the start position of auto pan. |
| PRESET + 18 + ENTER | To preset NO.18 preset position means to set the end position of auto pan. |
| CALL + 17 + ENTER | To call the NO.17 preset position means to turn on auto tracking. |
| CALL + 18 + ENTER | To call the NO.18 preset position means to turn on auto panning. |
| CALL + 19 + ENTER | To call the NO.19 preset position means to stop auto panning. |
| *PRESET + 20 + ENTER | To preset NO.20 preset position means to close the digital zoom. |
| *CALL + 20 + ENTER | To call the NO.20 preset position means to open the digital zoom. |

Auto Tracking: The Mini P/T Dome can automatically track from 1,2,3……16 preset position. Dwell time between 2 preset position is 4 secs.

Auto Panning: The auto pan function allows you to have the Mini P/T Dome move back and forth automatically, at a preset speed between the 2 preset positions. The dwell time between the start preset position and the end preset position is 3 seconds.

*** Option.**